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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,633	09/15/2003	Chung-Sam Jun	253/030	7925

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EXAMINER	
MARIAM, DANIEL G	
ART UNIT	PAPER NUMBER
2624	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/661,633	JUN ET AL.	
	Examiner	Art Unit	
	DANIEL G. MARIAM	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-20* is/are rejected.

7)☒ Claim(s) *4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/15/04 & 2/2/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 17 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. While claim 17 recites the limitation: "inspecting results of . . . an edge exposure of water process . . ", the specification says nothing about this feature, and thus lacks support in the specification. A similar limitation also occurs in claim 19.

Since claims 18 and 20 depend on claim 17, they are also rejected under 35 U.S.C. 112, first paragraph, for the same reason set forth above for claim 17.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 5-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bultman, et al. (6,829,559).

With regard to claim 1, Bultman, et al discloses an apparatus for inspecting a substrate (See for example, Figs. 3-6, 12, and 26-27, and their associated text), comprising: a first stage for supporting a substrate (See for example, item 42 in Fig. 12); a first image acquisition unit for acquiring a first image of a peripheral portion of the substrate supported by the first stage (See for example, detector 46a, in Fig. 12); a second stage for supporting the substrate (which reads on the second portion of the stage, as illustrated in Fig. 12, item 42); a second image acquisition unit for acquiring a second image of the substrate supported by the second stage (See for example, detector 46b, in Fig. 12); a transfer robot for transferring the substrate between the first stage and the second stage (See for example, col. 51, lines 32-34); and a data processing unit (See for example, item 54, in Fig. 12), connected to the first image acquisition unit and the second image acquisition unit, for inspecting results of an edge bead removal process and an edge exposure process performed on the substrate using the first image, and for inspecting for defects of patterns formed on the substrate using the second image (See for example, col. 52, line 31 through col. 54, line 23). Although Bultman, et al does not expressly use the language first stage and second stage, an ordinary artisan would have recognized the two separate blocks identified as item 42, in Figure 12 to be two stages that are set to support the specimen/wafer under measurement/inspection.

With regard to claim 2, the apparatus for inspecting a substrate as claimed in claim 1, wherein the first image acquisition unit comprises: a charge coupled device camera positioned over the substrate supported by the first stage for acquiring the first image (See for example, item 46, in Fig. 12; and col. 38, lin15-21); and a light source for illuminating the peripheral portion of the substrate (See for example, item 48, in Fig. 12).

With regard to claim 3, the apparatus for inspecting a substrate as claimed in claim 2, wherein the light source is a light emitting diode (See for example, col. 116, lines 1-3).

With regard to claim 5, the apparatus for inspecting a substrate as claimed in claim 2, further comprising a first driving unit and a second driving unit for causing a relative motion between the substrate supported by the first stage and the charge coupled device camera so that the first image acquisition unit acquires the first image (See for example, col. 69, lines 26-46; and Fig. 27 and its associated text).

With regard to claim 6, the apparatus for inspecting a substrate as claimed in claim 5, wherein the first driving unit and the second driving unit comprise: a first driving unit for moving the charge coupled device camera along a flat zone portion of the substrate supported by the first stage; and a second driving unit for rotating the first stage (Which reads on col. 134, line 31-67).

With regard to claim 7, the apparatus for inspecting a substrate as claimed in claim 1, wherein the second image acquisition unit comprises: an illuminating section for directing an illuminating light at an angle towards the substrate supported by the second stage (which reads on item 44, in Fig. 12); and a detecting section for detecting light reflected from the substrate to acquire the second image (as illustrated by the arrow provided to item 46b, in Fig. 12. Also, applicants' attention is invited to Fig. 27).

With regard to claim 8, the apparatus for inspecting a substrate as claimed in claim 7, wherein the illuminating section comprises: a beam generator for providing a laser beam; a beam expander for expanding the laser beam, a reflecting mirror for reflecting the expanded laser

beam; a beam deflector for deflecting the reflected laser beam, and a focusing lens for focusing the deflecting laser beam onto the substrate supported by the second stage (See Fig. 25 and is associated text).

With regard to claim 9, the apparatus for inspecting a substrate as claimed in claim 8, further comprising a third driving unit for moving the second stage so that the focused laser beam scans the entire surface of the substrate supported by the second stage (Which reads on Fig. 25: Fig. 12).

With regard to claim 10, the apparatus for inspecting a substrate as claimed in claim 1, wherein the data processing unit detects defects of the patterns formed on the substrate by comparing the second image with a reference image (See for example, col. 65, lines 50-65; and col.67, lines 25-44).

With regard to claim 11, the apparatus for inspecting a substrate as claimed in claim 10, further comprising a data storage unit, i.e., database, for storing the reference image (See for example, col. 67, line 25-28).

With regard to claim 12, the apparatus for inspecting a substrate as claimed in claim 7, wherein the second image comprises a reticle identification number or a reticle identification pattern for identifying a reticle used for forming the patterns (which reads on col. 53, lines 40-42).

With regard to claim 13, the apparatus for inspecting a substrate as claimed in claim 1, further comprising an alignment mark sensor positioned above the substrate supported by the

first stage for aligning the substrate supported by the first stage (See for example, col. 56, line 62 – col. 57, line 13).

With regard to claim 14, the apparatus for inspecting a substrate as claimed in claim 1, further comprising a data storage unit for storing inspection results processed by the data processing unit (which correspond to item 54, in Fig. 12).

With regard to claim 15, the apparatus for inspecting a substrate as claimed in claim 14, further comprising a display unit for displaying the inspection results (See for example, col. 66, lines 3-20; and col. 140, lines 46-47).

With regard to claim 16, the apparatus for inspecting a substrate as claimed in claim 1, further comprising a display unit for displaying the first and the second images (See for example, col. 66, lines 3-20; and col. 140, lines 46-47).

With regard to claim 17, claim 1 encompasses the limitation of this claim except claim 17 is directed to a method claim, and is rejected the same as claim 1. Thus, argument analogous to that presented above for claim 1 is applicable to claim 17.

With regard to claim 18, the method for inspecting a substrate as claimed in claim 17, wherein the substrate includes a silicon wafer (See for example, col. 152, lines 47-49), and acquiring the first image further comprises rotating the substrate and continuously acquiring the first image of the peripheral portion of the rotating substrate using an image acquisition unit disposed over the peripheral portion of the substrate (See for example, item 356, in Fig. 26).

With regard to claim 20, the method for inspecting a substrate as claimed in claim 17, wherein acquiring the second image further comprises: illuminating a light onto the substrate supported by the second stage, moving the substrate so that the light scans an entire surface of the substrate supported by the second stage; and acquiring the second image a light reflected from the substrate (See for example, Figs. 12 & 26-27).

Allowable Subject Matter

5. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The closest prior art to Bultman, et al does not disclose or fairly suggest wherein the data processing unit calculates a distance from a side surface of the substrate to a side surface of a photoresist film including the patterns in the first image and inspects results of an edge bead removal process and an edge exposure process performed on the substrate from the calculated distance. It is for this reason that claim 4 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent Application Publication Number: 2003/0030050 (See Fig. 5, and the associated text).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL G. MARIAM whose telephone number is 571-272-7394. The examiner can normally be reached on M-F (7:00-4:30) FIRST FRIDAY OFF.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MATTHEW BELLA can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DANIEL G MARIAM
Primary Examiner
Art Unit 2624

February 19, 2007